WHAT IS CLAIMED IS:

1. A protein having any one of the following amino acid sequences:

(a) an amino acid sequence represented by Sequence ID No. 1;

(b) an amino acid sequence comprising an amino acid substitution occurring at a part corresponding to a part of an amino acid sequence represented by Sequence ID No. 1;

(c) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence ID No. 1 of 60% or higher;

(d) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine and having a molecular weight of about 37 kDa as a monomer, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence ID No. 1 of 80% or higher; and,

(e) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine and derived from a microorganism belonging to the genus Mycobacterium, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence

ID No. 1 of 60% or higher.

2. A protein having an amino acid sequence represented by Sequence ID No. 1.

3. A protein having an amino acid sequence comprising an amino acid substitution from threonine to alanine occurring at a position corresponding to amino acid's position No.2 of an amino acid sequence represented by Sequence ID No. 1;

4. A protein having a molecular weight of about 37 kDa as a monomer which is obtainable from Mycobacterium aurum SC-S423 and which is capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine.

5. A gene encoding a protein having any one of the following amino acid sequences:

(a) an amino acid sequence represented by Sequence ID No. 1;

(b) an amino acid sequence comprising an amino acid substitution occurring at a part corresponding to a part of an amino acid sequence represented by Sequence ID No. 1;

(c) an amino acid sequence encoded by the nucleotide sequence of nucleotide's positions No. 1 to No. 1017 in the nucleotide sequence represented by Sequence ID No. 2;

(d) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a

racemic mixture of sec-butylamine, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence ID No. 1 of 60% or higher;

(e) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine and having a molecular weight of about 37 kDa as a monomer, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence ID No. 1 of 80% or higher; and,

(f) an amino acid sequence of a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine and obtainable from a microorganism belonging to the genus Mycobacterium, said amino acid sequence showing an amino acid identity with the amino acid sequence represented by Sequence ID No. 1 of 60% or higher.

6. A gene having any of the following nucleotide sequences:

(a) a nucleotide sequence of nucleotide's positions No. 1 to No. 1017 in the nucleotide sequence represented by Sequence ID No. 2; and,

(b) a nucleotide sequence comprising a nucleotide substitution from adenine to guanine occurring at a position corresponding to nucleotide's position No.4 of a nucleotide sequence of nucleotide's positions No. 1 to 1017 in the nucleotide sequence represented by Sequence ID No. 2;

(c) a nucleotide sequence of about 1020 bp which is amplified by PCR using as primers an oligonucleotide having the nucleotide sequence of nucleotide's positions No. 1 to 28 in the nucleotide sequence represented by Sequence ID No. 2 or an oligonucleotide having the nucleotide sequence represented by Sequence ID No. 11, and an oligonucleotide having a complementary nucleotide sequence to the nucleotide sequence of nucleotide's positions No. 999 to 1020 in the nucleotide sequence represented by Sequence ID No. 2 and as a template a chromosome DNA derived from a microorganism belonging to the Mycobacterium and which encodes a protein capable of converting acetophenone to an optically active 1-phenylethylamine in the presence of a racemic mixture of sec-butylamine.

7. A gene having a nucleotide sequence of nucleotide's positions No. 1 to 1017 in the nucleotide sequence represented by Sequence ID No. 2.

8. A gene having a nucleotide sequence comprising a nucleotide substitution from adenine to guanine occurring at a position corresponding to nucleotide's position No.4 of a nucleotide sequence of nucleotide's positions No. 1 to 1017 in the nucleotide sequence represented by Sequence ID No. 2.

9. A gene formed by connecting a promoter capable of functioning in a host cell to the gene of Claim 5 in a functional manner.

10. A vector containing the gene of Claim 5.

11. A transformant obtainable by transducing the gene of Claim 5 into a host cell.

12. A transformant obtainable by transducing the vector of Claim 10 to a host cell.

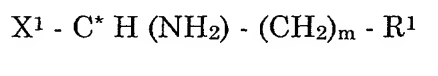
13. The transformant according to Claim 11 or Claim 12, wherein the host cell is a microorganism cell.

14. A method for producing a transformant, comprising a step of transducing the gene of Claim 5 or the vector of Claim 10 into a host cell.

15. A method for producing a protein of Claim 1, comprising a step of culturing a microorganism having the gene of Claim 5.

16. The method according to Claim 15, wherein said microorganism is the transformant of Claim 11 or 12.

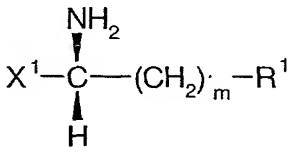
17. A method for producing an optically active amino compound represented by Formula (3):



$$X^1 - C^* H (NH_2) - (CH_2)_m - R^1 \qquad (3)$$

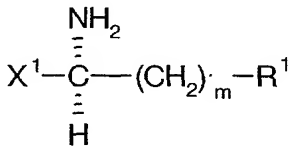
wherein X^1 is an optionally substituted C_1-C_9 alkyl group, an optionally substituted C_6-C_{14} aryl group, an optionally substituted C_7-C_{17} arylalkyl group, an optionally substituted C_4-C_{12} heteroaryl group, an optionally substituted C_5-C_{15} heteroarylalkyl group, an amino group, an aminocarbonyl group, a hydroxyl group, a thiol group, a guanidyl group, a cyano group, a halogen atom or a hydrogen atom, R^1 is a C_1-C_6 alkyl group, a carboxyl group, C_2-C_6 alkyloxycarbonyl group or a hydrogen atom, m is an integer of 0 to 6,

and * is an asymmetric carbon atom with the proviso that said optically active amino compound represented by Formula (3) has the following structure represented by Formula (3a):



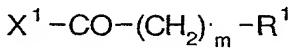
(3a)

when R^1 is a C_1-C_6 alkyl group or a hydrogen atom and said optically active amino compound represented by Formula (3) has the following structure represented by Formula (3b):



(3b)

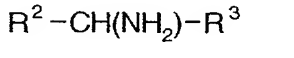
when R^1 is a carboxyl group or C_2-C_6 alkyloxycarbonyl group, which comprises reacting a ketone compound represented by Formula (1):



(1)

wherein X^1, R^1 and m have the meanings defined above,

in the presence of an amino group-containing compound represented by Formula (2):



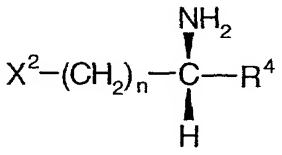
(2)

wherein R^2 is an optionally substituted C_1-C_6 alkyl group, an optionally substituted phenyl group or an optionally substituted C_7-C_{10} phenylalkyl group, R^3 is a hydrogen atom, a C_1-6 alkyl group, a carboxyl group or a C_2-C_5

alkyloxycarbonyl group with the protein of Claim 1.

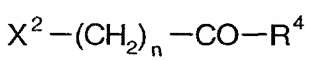
18. The method according to Claim 17, wherein R^1 of the ketone compound represented by Formula (1) is a carboxyl group.

19. The method according to Claim 17, which is a method for producing an optically active amino compound represented by Formula (6):



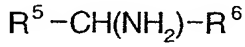
(6)

wherein X^2 is an optionally substituted phenyl group or an optionally substituted naphthyl group, R^4 is an C_1-C_6 alkyl group, and n is an integer of 0 to 4, which comprises reacting a ketone compound represented by Formula (4):



(4)

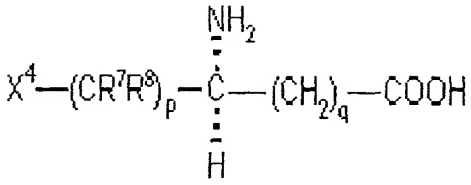
wherein X^2, R^4 and n have the meanings defined above in the presence of an amino group-containing compound represented by Formula (5):



(5)

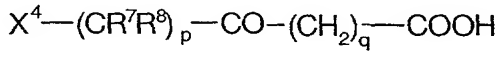
wherein R^5 is an optionally substituted C_1-C_6 alkyl group, an optionally substituted phenyl group or an optionally substituted C_7-C_{10} phenylalkyl group, R^6 is a hydrogen atom, a C_1-C_6 alkyl group, a carboxyl group or a C_2-C_5 alkyloxycarbonyl group, with the protein of Claim 1.

20. The method according to Claim 17, which is a method for producing an optically active amino compound represented by Formula (8):



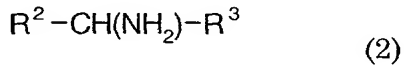
(8)

wherein X^4 is an optionally substituted C_6-C_{14} aryl group, an optionally substituted C_4-C_{12} heteroaryl group, an optionally substituted C_1-C_3 alkyl group, an amino group, an aminocarbonyl group, a hydroxyl group, a thiol group, a guanidyl group or a hydrogen atom, R^7 and R^8 may be the same or different and each is a hydrogen atom, a C_1-C_3 alkyl group or a hydroxyl group, p is an integer of 0 to 3 and q is an integer of 0 to 2, which comprises reacting a ketone compound represented by Formula (7):



(7)

wherein X^4, R^7, R^8, p and q have the meanings defined above in the presence of an amino group-containing compound represented by Formula (2):



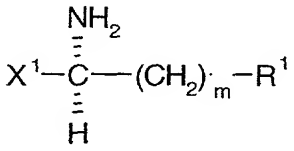
(2)

wherein R^2 is an optionally substituted C_1-C_6 alkyl group, an optionally substituted phenyl group or an optionally substituted C_7-C_{10} phenylaklyl group, R^3 is a hydrogen atom, a C_1-C_6 alkyl group, a carboxyl group or a C_2-C_5 alkyloxycarbonyl group, with the protein of Claim 1.

21. A method for improving the ratio of an amino compound represented by Formula (9):

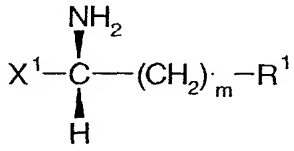
X^1 - C* H (NH_2) - $(CH_2)_m$ - R^1 (9)

wherein X^1 is an optionally substituted C_1-C_9 alkyl group, an optionally substituted C_6-C_{14} aryl group, an optionally substituted C_7-C_{17} arylalkyl group, an optionally substituted C_4-C_{12} heteroaryl group, an optionally substituted C_5-C_{15} heteroarylalkyl group, an amino group, an aminocarbonyl group, a hydroxyl group, a thiol group, a guanidyl group, a cyano group, a halogen atom or a hydrogen atom, R^1 is a C_1-C_6 alkyl group, a carboxyl group, C_2-C_6 alkyloxycarbonyl group or a hydrogen atom, m is an integer of 0 to 6, and * is an asymmetric carbon atom with the proviso that said amino compound represented by Formula (9) has the following structure represented by Formula (9a):



(9a)

when R^1 is a C_1-C_6 alkyl group or a hydrogen atom and said optically active amino compound represented by Formula (9) has the following structure represented by Formula (9b):



(9b)

when R^1 is a carboxyl group or C_2-C_6 alkyloxycarbonyl group, which comprises reacting a ketone compound represented by Formula (14):

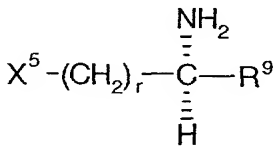
$$R^2 - CO - R^3 \qquad (14)$$

wherein R^2 is an optionally substituted C_1-C_6 alkyl group, an optionally substituted phenyl group or an optionally substituted C_7-C_{10} phenylalkyl group, R^3 is a hydrogen atom, a C_1-C_6 alkyl group, a carboxyl group or a C_2-C_5 alkyloxycarbonyl group, in the presence of an amino group-containing compound represented by Formula (13):

$$X^1 - CH(NH_2) - (CH_2)_m - R^1 \qquad (13)$$

wherein X^1, R^1 and m have the meanings defined above, with the protein of Claim 1.

22. The method according to Claim 21, which is a method for improving the ratio of an amino compound represented by Formula (12):



(12)

wherein X^5 is an optionally substituted phenyl group or an optionally substituted naphthyl group, R^9 is a C_1-C_6 alkyl group and r is an integer of 0

to 4, which comprises reacting an amino group-containing compound represented by Formula (10):

$$X^5-(CH_2)_r-CH(NH_2)-R^9 \quad (10)$$

wherein X^5, R^9 and r have the meanings defined above in the presence of a ketone compound represented by Formula (11):

$$R^{10}-CO-R^{11} \quad (11)$$

wherein R^{10} is an optionally substituted C_1-C_6 alkyl group, an optionally substituted phenyl group or an optionally substituted C_7-C_{10} phenylalkyl group, R^{11} is a hydrogen atom, a C_1-C_6 alkyl group, a carboxyl group or a C_2-C_5 alkyloxycarbonyl group, with the protein of Claim 1.